Name _____ Date _____

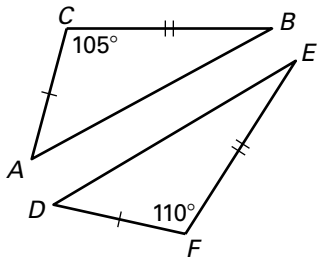
LESSON 5.6

Practice A

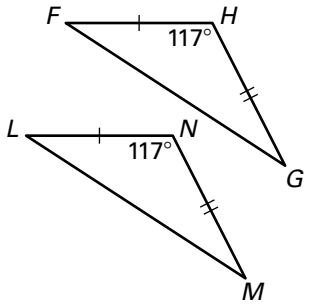
For use with pages 349–355

Complete with <, >, or = .

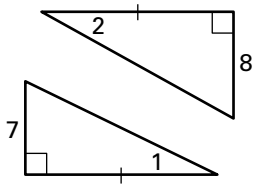
1. AB __?__ DE



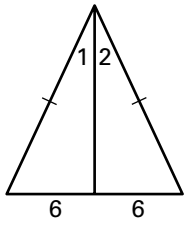
2. FG __?__ LM



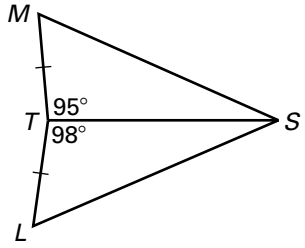
3. $m\angle 1$ __?__ $m\angle 2$



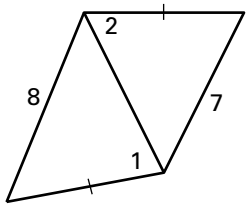
4. $m\angle 1$ __?__ $m\angle 2$



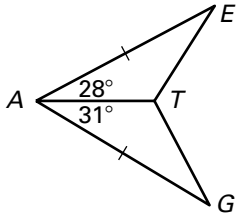
5. MS __?__ LS



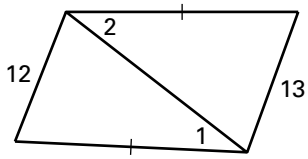
6. $m\angle 1$ __?__ $m\angle 2$



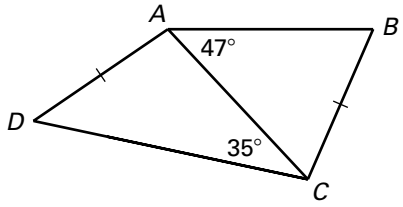
7. ET __?__ GT



8. $m\angle 1$ __?__ $m\angle 2$



9. Error Analysis *Explain* why the student's reasoning is not correct.



By the Hinge Theorem, $AB > DC$.

Copyright © Holt McDougal. All rights reserved.

Name _____ Date _____

LESSON 5.6

Practice A *continued*

For use with pages 349–355

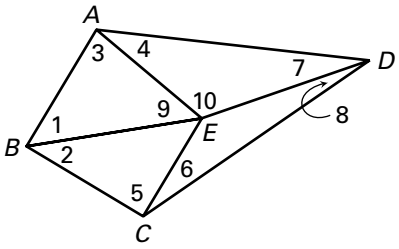
Match the conclusion on the right with the given information. *Explain* your reasoning.

10. $AB = BC, m\angle 1 > m\angle 2$ **A.** $m\angle 7 > m\angle 8$

11. $AE > EC, AD = CD$ **B.** $AD > AB$

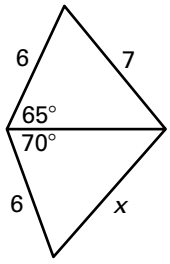
12. $m\angle 9 < m\angle 10, BE = ED$ **C.** $m\angle 3 + m\angle 4 = m\angle 5 + m\angle 6$

13. $AB = BC, AD = CD$ **D.** $AE > EC$

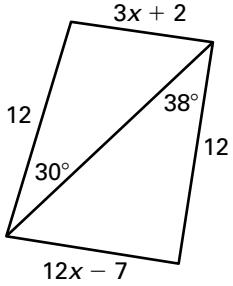


Use the Hinge Theorem or its converse and properties of triangles to write and solve an inequality to describe a restriction on the value of *x*.

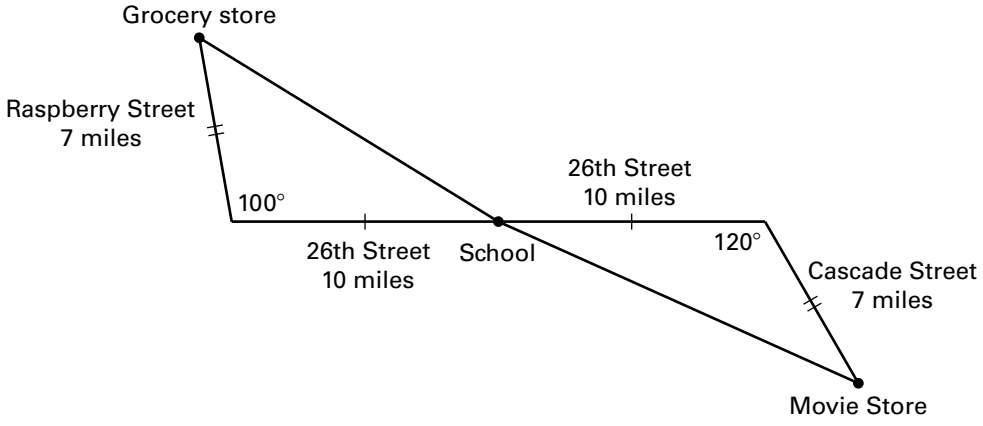
14.



15.



16. Shopping You and a friend are going shopping. You leave school and drive 10 miles due west on 26th Street. You then drive 7 miles NW on Raspberry Street to the grocery store. Your friend leaves school and drives 10 miles due east on 26th Street. He then drives 7 miles SE on Cascade Street to the movie store. Each of you has driven 17 miles. Which of you is farthest from your school?



17. Write the first statement for an indirect proof of the situation.
In $\triangle MNO$, if $\overline{MP}$ is perpendicular to $\overline{NO}$, then $\overline{MP}$ is an altitude.

Copyright © Holt McDougal. All rights reserved.

Lesson 5.5, continued

Review for Mastery

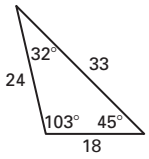
1. $m\angle A < m\angle C < m\angle B$; $BC < AB < AC$

2. $m\angle E < m\angle F < m\angle D$; $DF < DE < EF$

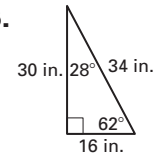
3. $m\angle H < m\angle I < m\angle G$; $GI < GH < HI$

4. $m\angle J < m\angle L < m\angle K$; $KL < JK < JL$

5.



6.



7. greater than 3 cm and less than 7 cm

8. greater than 5 in. and less than 19 in.

9. greater than 6 ft and less than 14 ft

10. greater than 1 m and less than 21 m

11. greater than 16 in. and less than 34 in.

12. greater than 7 mi and less than 9 mi

Challenge Practice

1. x is between 8 and 16. **2.** x is between 6.5 and 7. **3.** x is between $\frac{5}{3}$ and 8.

4. x is greater than 2.

5. Because $AC = BC$, $\triangle ABC$ is isosceles. By the Base Angles Theorem, you can conclude that $\angle CAB \cong \angle ABC$. In $\triangle ABE$, you know that $m\angle CAB < m\angle ABE$, because $m\angle ABE = m\angle ABC + m\angle CBE$ and $m\angle ABC = m\angle CAB$. So, $BE < AE$ because if one angle of a triangle is smaller than another angle, then the side opposite the smaller angle is shorter than the side opposite the larger angle.

6. $\overline{MJ} \perp \overleftrightarrow{JN}$, so $\triangle MJN$ is a right triangle. The largest angle in a right triangle is the right angle, so $m\angle MJN > m\angle MNJ$. Finally, you can conclude that $MN > MJ$ because if one angle of a triangle is larger than another angle, then the side opposite the larger angle is longer than the side opposite the smaller angle.

7. If a line segment is perpendicular to a plane, then it is perpendicular to every line segment in the plane, so $\overline{PC} \perp \overline{DC}$. You also know that $\triangle PCD$ is a right triangle. The largest angle in a right triangle is the right angle, so $m\angle PCD > m\angle PDC$. Finally, you can conclude that $PD > PC$ because if one angle of a triangle is larger than another angle, then the side opposite the larger angle is longer than the side opposite the smaller angle.

Lesson 5.6

Practice Level A

1. < **2.** = **3.** < **4.** = **5.** < **6.** > **7.** < **8.** <

9. In order to use the Hinge Theorem, the student must know the measure of the included angles $\angle ACB$ and $\angle CAD$. **10.** D **11.** A

12. B **13.** C **14.** $x > 7$ **15.** $x > 1$ **16.** Apply the Hinge Theorem to conclude that your friend is farthest from the school. **17.** Assume $\overline{MP}$ is not an altitude.

Practice Level B

1. >; Hinge Thm. with $m\angle R > m\angle U$

2. <; Hinge Thm. with $m\angle DGE < m\angle EGF$

3. <; Hinge Thm. with $m\angle JMK < m\angle LKM$

4. >; Converse of Hinge Thm. with the side opposite $\angle 1$ longer than the side opposite $\angle 2$.

5. >; Converse of Hinge Thm. with the side opposite $\angle 1$ longer than the side opposite $\angle 2$.

6. <; Converse of Hinge Thm. with the side opposite $\angle 1$ shorter than the side opposite $\angle 2$.

7. >; Converse of Hinge Thm. with the side opposite $\angle 1$ longer than the side opposite $\angle 2$.

8. =; The triangles are $\cong$ by SAS. **9.** $x < 34$

10. $x > 4$ **11.** Assume temporarily that the two parallel lines contain two sides of a triangle.

12. Assume temporarily that the transversal is not perpendicular to the parallel lines.

13. a. Because $m\angle 3 < m\angle 1$, by the Hinge Thm, the far side of the table is lower than the near side.
b. By the Converse of the Hinge Thm., $\angle 4$ will be larger than $\angle 2$ until the distance between the tops of each pair of legs is the same.

14. the second angler; The included $\angle$ for the second angler is 96° and for the first angler is 90°.

15. F, E, B, A, D, C **16.** Temporarily assume that $AB > AC$. The steps of the proof correspond to the steps of the proof in Ex. 15.

Practice Level C

1. = **2.** < **3.** < **4.** > **5.** > **6.** > **7.** never

8. never **9.** always **10.** never **11.** never

12. sometimes **13.** $x > 14$ **14.** $x > 1$

15. Family A; The included angle for Family A is 90° and for Family B is 89°.

Copyright © Holt McDougal. All rights reserved.